

REMARKS

It is noted from paragraph 1 on page 2 of the Examiner's Office Action letter that the Terminal Disclaimer filed in the U.S. Patent and Trademark Office on July 21, 2006 has been accepted.

Claim 1 has been objected to for the reasons set forth in paragraph 2 of the Examiner's Office Action letter. As the Examiner will note, claim 1 has been amended in an attempt to eliminate the informality referred to by the Examiner, and accordingly, it is believed that this objection has been eliminated.

Claims 1, 6 and 7 have been rejected by the Examiner under 35 USC 103(a) as being unpatentable over Agostini et al., US 2003/0092801 in view of Tanaka et al., U.S. Patent 5,622,998 and Tanaka et al., U.S. Patent 6,239,253. Claims 2 and 8-10 have been rejected by the Examiner under 35 USC 103(a) as being unpatentable over Agostini '801 in view of Tanaka '998 and Tanaka '253 as applied to claims 1, 6 and 7 and further in view of Sandstrom, U.S. Patent 5,489,628. Claim 11 has been rejected by the Examiner under 35 USC 103(a) as being unpatentable over Agostini '801 in view of Tanaka '998 and Tanaka '253 and further in view of Hahn et al., U.S. Patent 6,646,006. These rejections are respectfully traversed.

The present invention is directed to a tire having a tire tread formed from a rubber composition which contains a combination of a deproteinized form of natural rubber, silica and a silane coupling agent of formula (I), as recited in claim 1 of the present application. Advantageously, the silane coupling agent has a specific structure with an average value of ℓ of 2.1 to 3.5 and is compounded with a graft-copolymerized natural rubber and/or an epoxidized

natural rubber containing protein in the natural rubber in an amount of not more than 0.10% by weight, converted to a nitrogen content. The employment of this combination of features advantageously provides improved properties in the areas of processibility, rolling resistance, abrasion resistance, and/or wet skid performance as evidenced by the various test results found in the present specification.

In the examples in the specification of the present application, it is clear that Examples 23 and 24, which satisfy the claims of the present application, are excellent in processibility, particularly without lowering such features as rolling resistance, abrasion resistance, and wet skid performance, as compared with Examples 21 and 22 wherein polymer 2 and polymer 3 contain protein in the natural rubber in an amount of more than 0.10% by weight, converted to nitrogen content, and Examples 15 and 16 wherein the silane coupling agent A, that is, tetrasulfide is utilized. For ease of comparison, Table 1 is presented herein, Table 1 being newly arranged from Tables 4 and 6 of the present application with Examples 21 to 24 being converted on the basis of Comparative Example 7 as 100. Thus, in referring to Table 1, it can be realized that the advantageous results of the present invention are based upon the use of a specific silane coupling agent, having a specific structure wherein the average value of ℓ in S_ℓ is 2.1 to 3.5 and the graph-polymerized natural rubber and/or epoxidized natural rubber containing protein within the natural rubber in an amount of not more than 0.1% by weight, converted to a nitrogen content, are used together.

Table 1

	Ex.						Com. Ex.
	15	16	21	22	23	24	7
Properties							
Processability	104	103	109	107	110	100	100
Rolling Resistance	105	104	101	100	104	103	100
Abrasion Resistance	100	101	101	102	101	102	100
Wet Skid Performance	103	106	101	103	102	105	100

Agostini '801 relied upon by the Examiner is directed to a rubber composition which does not appear to even remotely address the advantages achieved by the present invention, that is, the advantageous improvement in such properties as processability, rolling resistance, abrasion resistance and/or wet skid performance. As such, the prior art reference is more concerned with a rubber composition containing a dispersion of a starch/plasticizer composite, which does not form part of the present invention, and furthermore, as recognized by the Examiner, Agostini '801 does not disclose the use of a particular type of rubber, that is, a rubber which contains at least 5% by weight of natural rubber grafted-copolymerized with an organic compound, said rubber component containing protein within the natural rubber grafted-copolymerized product in an amount of at most 0.10% by weight converted to nitrogen content. In addition, the coupling agent as recited in Col. 3 of Agostini '801 is not the same as the coupling agent of the present invention and there appears to be no recognition in the referenced patent that the average value of ℓ , as defined in Formula (1) of claim 1 of the present application falls within the range of 2.1 to 3.5. Thus, the rubber composition of Agostini '801 differs in

many respects when compared to a pneumatic tire tread having the composition as defined by the claims of the present application.

The Examiner, recognizing the deficiencies of Agostini '801 has further relied upon Tanaka '998 and Tanaka '253 in an attempt to fill the deficiencies of Agostini '801. However, neither of the Tanaka references describes or suggests the use of Applicants' specific silane coupling agent wherein the value of ℓ in Formula (1) as defined in claim 1 of the present application falls within the range of 2.1 to 3.5 and is compounded in a deproteinized natural rubber containing protein in an amount of not more than 0.10% by weight, converted to a nitrogen content, in order to improve processibility, rolling resistance, abrasion resistance and wet skid performance. Furthermore, neither of the Tanaka references even remotely discloses or suggests the use of its rubber composition in the tread portion of a vehicle tire. As a matter of fact, Tanaka '998 is more directly related to a depolymerized natural rubber which is useful as a raw material for adhesives, sealants, caulking compounds, plasticizers, and the like. Accordingly, to combine the references as suggested by the Examiner requires a reconstruction of the teachings of both the primary and secondary references in view of the Applicants' own disclosure.

In rejecting claims 2 and 8-10, the Examiner, in addition to the above references, has further relied upon Sandstrom '628. It is the Applicants' position that Sandstrom '628 fails to disclose the use of the particular silane coupling agent having the specific formula recited in claim 1 of the present application. In this regard, it should be noted that Sandstrom '628 employs in several examples in Tables II and III, at Cols. 8-9 thereof, a silane coupling agent "Si69." However, as disclosed at page 17, lines 14-15 of the present specification, this silane

coupling agent "Si69" has an average ℓ value of 3.8 which falls outside of the range for the " ℓ " value for the silane coupling agent recited in claim 1 of the present application.

In connection with the rejection of claim 11, the Examiner is further relying upon Hahn '066 to allegedly show a rubber composition containing the Applicants' specific coupling agent. However, the rubber utilized in the rubber composition of Hahn '066 is not a deproteinized form of rubber and thus there is no suggestion or recognition of the desirability of using a deproteinized rubber in an amount of protein of at most 0.10% by weight, converted to nitrogen content. As noted on pages 10 and 11 of the present application, it is stated that the protein in the natural rubber is reduced to at most 0.10% converted to nitrogen content, which enables the natural rubber to be efficiently modified and high effects of modification can be obtained. It is understandable that the rubber composition of Hahn '066 is different from that of the present invention inasmuch as Hahn '066 is concerned with tire sidewall components and/or tread supporting rings for use in tire ring assemblies and thus is not concerned with solving the problems encountered in a tire tread, that is, processability, rolling resistance, abrasion resistance and/or wet skid performance. In fact, in Col. 3, lines 17-19, the patentees state that a significance aspect of their invention is the reduction of heat generation in the rubber composition which contains a dispersion of polymers. Thus, Hahn '066 is directed to solving completely different problems when compared to that of the present invention and as such, utilizes a rubber composition which is also completely different from that of the present invention.

Accordingly, in view of the above amendments and remarks, reconsideration of the rejections and allowance of all of the claims of the present application are respectfully requested.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Joseph A. Kolasch Reg. No. 22,463 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

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